



UNITED STATES PATENT AND TRADEMARK OFFICE

lh

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,289	06/24/2003	Takeshi Endo	15162/05510	1183

24367 7590 01/10/2006

SIDLEY AUSTIN BROWN & WOOD LLP
717 NORTH HARWOOD
SUITE 3400
DALLAS, TX 75201

EXAMINER

LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
----------	--------------

2872

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/602,289

Applicant(s)

ENDO ET AL.

Examiner

Arnel C. Lavarias

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/31/05, 6/24/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 2-4, 10 and 13-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5-9, 11 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/24/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. After reviewing the restriction requirement made in the Office Action dated 9/22/05, an oversight was discovered with regard to the disposition of Claim 10. In Section 7, it was stated that Claims 10-12 would be examined along with the elected invention. However, Claim 10 appears to be drawn to the invention as set forth in Invention IV. Thus, the disposition of the claims in the restriction requirement should be as follows:

Invention I- Claims 2-4, 16-17.

Invention II- Claims 5-9.

Invention III- Claims 13-15.

Invention IV- Claims 10, 18-21.

Claim 1 links Inventions I-IV.

Claims 11-12 will be examined along with the elected invention.

The Examiner apologizes for any inconvenience this oversight may have caused.

2. Applicant's election without traverse of Invention II (Claims 5-9) in the reply filed on 10/31/05 is acknowledged.
3. Claims 2-4, 10, 13-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/31/05.

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

5. The drawings were received on 6/24/03. These drawings are objected to for the following reason(s) as set forth below.
6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:
Figure 5- Reference numeral 230c
Figure 12- Reference numerals 530a, 530c.
7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:
Figure 5- Reference numeral 330b (See Paragraph 0036).
8. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be

Art Unit: 2872

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

9. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Examples of such errors are set forth infra.

10. The disclosure is objected to because of the following informalities:

Paragraph 0007, line 7; Paragraph 0043, line 2- 'an' should read 'a'

Paragraph 0012, line 33- 'another' should read 'other'

Paragraph 0039, line 3- insert 'is' after 'This'

Paragraph 0044, lines 1-2- 'in stead' should read 'instead'

Paragraph 0045, line 1- 'sown' should read 'shown'.

Appropriate correction is required.

Claim Objections

11. Claim 5 objected to because of the following informalities:

Claim 5 recites the limitations '...the light source section supplies a divergent light as the illumination light...' and '...the illumination light which has a divergent angle of 0 degrees...'. These two limitations appear to be contradictory to each other since divergent light is not collimated light, and only collimated light has a divergent angle of 0

degrees (i.e. it has no divergence since all the light rays in collimated light are parallel).

For purposes of examination, the limitation ‘...which has a divergent angle of 0 degrees...’ has not been given any significant patentable weight.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1, 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. (U.S. Patent Application Publication US 2002/0030773 A1) in view of Tedesco (U.S. Patent No. 5418631).

Endo et al. discloses an image display apparatus (See for example Figures 1-10) comprising a light source section (See 1, 1R, 1G, 1B in Figures 1-10) for supplying an illumination light; a display element (See 5 in Figures 1-10) for modulating a given illumination light into an image light showing an image; a transmission type hologram (See 2 in Figures 1-10) for diffracting and transmitting the illumination light from the light source section so as to guide the illumination light to the display element, the transmission type hologram having diffusing properties; and an eyepiece optical system (See 6, 6a, 6b in Figures 1-10) for guiding the image light from the display element to an eye of a viewer so as to provide an enlarged virtual image of the image. Endo et al.

additionally discloses the light source section supplying divergent light as the illumination light (See 1 in Figures 1-10); the light source section having a light emitting diode (See for example Paragraph 0035); and the display element being a liquid crystal display element (See for example Paragraph 0034). Endo et al. lacks the transmission type hologram being a reflection type hologram. However, Tedesco teaches a conventional illumination system for a flat panel liquid crystal display system (See for example Figures 2-4), wherein a reflective type hologram having diffusing properties and for diffracting and reflecting illumination light is utilized in the illumination beam path (See for example 16, 43, 44 in Figures 2-3; col. 3, line 62-col. 4, line 31). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the transmission type hologram be a reflection type hologram, as taught by Tedesco, in the display apparatus of Endo et al., to allow for repositioning of the illumination source based on the intended application, while allowing the optical system to be compact.

14. Claim 5, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. in view of Tedesco as applied to Claim 1 above, and further in view of Khazova et al. (WO 00/08519 A2).

Endo et al. in view of Tedesco discloses the invention as set forth above in Claim 1, except for the reflection type hologram having positive optical power and changing the illumination light into a substantially parallel light. However, Khazova et al. teaches a conventional illumination system for a liquid crystal display device (See for example Figures 9, 19) which utilizes a reflective type hologram having diffusive properties (See

61' in Figure 19). In particular, the reflective type hologram includes positive optical power and converts the incident diverging light from the illumination source to collimated light that is routed to the viewing zone (See Page 59, line 23-Page 60, line 15). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the reflection type hologram have positive optical power and change the illumination light into a substantially parallel light, as taught by Khazova et al., in the display apparatus of Endo et al. in view of Tedesco, for the purpose of reducing the number of optical elements required to construct the optical system since the reflective, powered holographic element now performs the functions of several optical elements (i.e. it combines the functions of the holographic element 2 and focusing lens 3 of Endo et al.), leading to reduced cost and optical alignment complexity.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. in view of Tedesco as applied to Claim 1 above, and further in view of Khazova et al.

Endo et al. in view of Tedesco discloses the invention as set forth above in Claim 1, but does not explicitly disclose the reflection type hologram separating a zero-order diffracted reflection light from a first-order diffracted reflection light in a different direction, and the display element being disposed on an optical path of the first order diffracted reflection light of the illumination light diffracted and reflected by the reflection type hologram and a downstream side of position where the zero-order diffracted reflection light is substantially separated from the first order diffracted reflection light. However, Khazova et al. teaches a conventional illumination system for a liquid crystal display device (See for example Figures 9, 19) which utilizes a reflective

type hologram having diffusive properties (See 61' in Figure 19). In particular, the reflection type hologram separates the zero-order diffracted reflection light from the first order diffraction light (See for example 61 in Figures 9, 19, wherein the zero order light from 61 is denoted by the dashed lines, and the first order light is denoted the solid lines routed to the viewing zone), and the display element (See 62, 63 in Figures 9, 19) is disposed on an optical path of the first order diffracted reflection light of the illumination light diffracted and reflected by the reflection type hologram and a downstream side of position where the zero-order diffracted reflection light is substantially separated from the first order diffracted reflection light. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the reflection type hologram separate a zero-order diffracted reflection light from a first-order diffracted reflection light in a different direction, and the display element be disposed on an optical path of the first order diffracted reflection light of the illumination light diffracted and reflected by the reflection type hologram and a downstream side of position where the zero-order diffracted reflection light is substantially separated from the first order diffracted reflection light, as taught by Khazova et al., in the display apparatus of Endo et al. in view of Tedesco, for the purpose of reducing or eliminating optical noise (such as from Fresnel or multiple reflections) in the viewed image, thus improving visibility, brightness uniformity, and sharpness of the viewed image.

16. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. in view of Tedesco as applied to Claim 1 above, and further in view of Abbott et al. (U.S. Patent No. 5999281).

Endo et al. in view of Tedesco discloses the invention as set forth above in Claim 1, but does not explicitly disclose the reflection type hologram having diffusing anisotropy and makes a diffusing angle of the diffracted and reflected illumination light different in two direction which cross perpendicular to each other, the diffusion angle of the reflection type hologram in horizontal direction with respect to the viewer being larger than that in the vertical direction or the diffusion angle of the reflection type hologram being larger than that in a direction of a line of intersection between the reflection type hologram and a plane including a center of the display element, an emission point of the light source section, and a center of the reflection type hologram. However, Abbott et al. teaches that conventional diffusion hologram screens for image display systems (See Abstract; 10 in Figures 3, 7) may be constructed in such a way that the diffusion hologram exhibits diffusing anisotropy and makes a diffusing angle of the diffracted and reflected illumination light different in two direction which cross perpendicular to each other (In the instant case, the diffusing anisotropy may be made elliptical, as opposed to circular. See 115 in Figures 3, 7). Further, the diffusion angle of the reflection type hologram in the horizontal direction (X direction as shown in Figure 7) with respect to the viewer may be made larger than that in the vertical direction (Y direction as shown in Figure 7) (See 115 in Figures 3, 7). It is also noted that this horizontal direction (X direction as shown in Figure 7) is a direction that is different than that direction defined by a line of intersection between the diffusion hologram and a plane including a center of the display element, an emission point of the light source section, and a center of the diffusion hologram (i.e. the Y direction as shown in Figure 7). Thus, it would have been

Art Unit: 2872

obvious to one having ordinary skill in the art at the time the invention was made to have the reflection type hologram have diffusing anisotropy and make a diffusing angle of the diffracted and reflected illumination light different in two direction which cross perpendicular to each other, the diffusion angle of the reflection type hologram in horizontal direction with respect to the viewer being larger than that in the vertical direction or the diffusion angle of the reflection type hologram being larger than that in a direction of a line of intersection between the reflection type hologram and a plane including a center of the display element, an emission point of the light source section, and a center of the reflection type hologram, as taught by Abbott et al., in the display apparatus of Endo et al. in view of Tedesco, to take advantage of the improved brightness consistency, reduced lateral color shift, and high diffraction efficiency provided by the diffusion hologram of Abbott et al.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias
Patent Examiner
Group Art Unit 2872
1/7/06